Litemax Proposal to Televic

Dear Mr. Claeys Luc and Mr. Van Doorselaer Geert,

Thank you very much to offer us this inquiry and this opportunity. The complete proposal is attached as below.

1. Technical preliminary specification of the panel TFT panel 28 inch:

1.1 Introduction

Litemax Part Number: SSF2823-ENN-A01
Description: 28", 500nits, 1366*254, 1/3 cut of a 32 inch 60 Hz TFT panel, DC 24V with build in LED driver, 4-in-1 economical packing (4 units in one carton)

1.2 TFT panel properties

		Required Specification	SSF2823-ENN-A01
Diagonal	inch	27.9	28
Panel format	pixels	1366 x 256	1366 x 254
Display area dimensions (minimum)	mm	697 x 130	697.7 x 129.7
Outline dimensions (maximum)	mm	735 x 170 x 17	735.4 x 170.5 x 17.8
Operating temperature range	˚C	0 to 50	0 to 50
Storage temperature range	˚C	-20 to 60	-20 to 60
Viewing angle (horizontal / vertical) (CR＞10)	degrees	160 / 170	178/178
Typical brightness (minimum)	(cd/m2)	500	500
Typical contrast (minimum)		1000:1	2000:1
Colour depth	bits / colour	8	8
Power consumption (at 500cd/m2)	W	TBD	27.4
Power supply input voltage	V	5 or 12	12
Signal interface		LVDS single or dual link	LVDS single link
Panel refresh rate	Hz	60	60
Backlight technology		LED	LED
LED driver power supply voltage	V	12 or 24	24
LED driver dimming input		Digital , PWM	PWM

1.3 Acceptance criteria

1.3.1 Uniformity

8F, No.137, Lane 235, Pau-chiau Rd., Shin-dian Dist, New Taipei city, 23145, Taiwan R.O.C.
Tel: +886-2-8919-1858 Fax: +886-2-8919-1300

We confirm that SSF2823-ENN-A01 can meet this criterion.

1.3.2 Light leakage

We confirm that SSF2823-ENN-A01 can meet this criterion.

1.3.3 Image retention

Image retention will be followed by panel manufacturer's standard QC criteria.

1.3.4 Electrical / electronic defects

Understood and agreed.

1.3.5 Brightness

Understood and agreed.

1.3.6 Contrast

Understood and agreed.

2 Project parameters and project concerns:

2.1 Project parameters:

According to our previous communication, the expected volume is total 5,290pcs including spare parts. So, this proposal is prepared according to this amount. If there are any adjustments in the future, please kindly inform us.

For the delivery time and price of prototypes, here is our proposal:

Litemax Part Number: SSF2823-ENN-A01
Description: 28", 500nits, 1366*254, 1/3 cut of a 32 inch 60 Hz TFT panel, DC 24V with build in LED driver, 4-in-1 economical packing (4 units in one carton)
Unit price: USD585
Included components: High brightness panel with build in LED driver
Price term: FOB Taiwan
Leadtime: 4 weeks after PO issue
Warranty term: 12 months after shipping date

2.2 Payment terms and pricing:

For the payment term, standby letter of credit payment after reception of the goods, net 30 days is suggested.

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To have fixed pricing for the series, we suggest to purchase the original panel based on total demand quantity of this project firstly because this component is always the cause to price adjustment. Once this factor can be excluded, the unit price can be fixed without any problems.

Per our meeting in ISE fair couple weeks ago, Litemax can share the investment of the original panel purchase with Televic equally as our support to this project. The total amount is around USD1,000,000 based on 5,290pcs. After receiving the payment of USD500,000 from you, we will invest the same number to purchase the panel immediately.

Assuming the above proposal is agreed by Televic, please find the pricing information as below:

Litemax Part Number: SSF2823-ENN-A01

Description: 28", 500nits, 1366*254, 1/3 cut of a 32 inch 60 Hz TFT panel, DC 24V with build in LED driver, 4-in-1 economical packing (4 units in one carton)

Unit price: USD495

Included components: High brightness panel with build in LED driver

Price term: FOB Taiwan

Warranty term: 12 months after shipping date

For the second year warranty, additional 5% will be charged.

Since the panel change factor is excluded already, the spare part price will be the same fixed price as well.

2.3 Delivery:

Yes, panel industry is fast changing market. To overcome this problem, we suggest to purchase the original panel based on total demand quantity of this project in advance.

The standard leadtime is 4 weeks for additional quantity.

We also can discuss possibility to ship the display through sea shipment to stock in our Bremen warehouse. In that way, you can save expensive air freight cost and get instant stock availability.

2.4 Incoterms:

The freight cost is adjusted per quarter by the change of oil price and other cost; therefore, it's very difficult to know how much we should add to the unit price. So, DAP Izegem Belgium term is not suggested here. Please kindly understand it.

Here is the proposal based on FOB term:

Litemax Part Number: SSF2823-ENN-A01

Description: 28", 500nits, 1366*254, 1/3 cut of a 32 inch 60 Hz TFT panel, DC 24V with build in LED driver, 4-in-1 economical packing (4 units in one carton)

Unit price: USD495

Included components: High brightness panel with build in LED driver

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Tel: +886-2-8919-1858 Fax: +886-2-8919-1300

Price term: FOB Taiwan
Warranty term: 12 months after shipping date
For the second year warranty, additional 5% will be charged.

2.5 Type testing:

The test reports of already undertaken type are:

- Operation Vibration，IEC61373: You can see the test video via this link http://www.youtube.com/watch?v=EI6CtYE85ec.
- Non-Operation Vibration，IEC61373: You can see the test video via this link: http://www.youtube.com/watch?v=blRXgbzvZ-I
- Vibration and shock: The complete report is attached in the end of this proposal.

2.6 Reliability:

1. Understood. The specification of SSF2823-ENN-A01 is indicated in Part 1.2.

2. Understood and agreed except for “One pixel reacts in a false manner during delivery state of the train.” The panel we purchase from panel manufacturer is Z grade, also the best quality version. Generally speaking, the definition of Z grade is zero bright pixels instead of zero defective (bright or dark) pixels. According to our experiences, the percentage of dark pixels is 15~20%. It means that around 85~80% can achieve zero defective (bright or dark) pixels.

   The MTBF figure is attached in the end of this proposal.

3. Sorry but panel manufacturer can’t provide us with this data.

   Yes, LED backlight can be replaced but we sincerely suggest to let Litemax handle it in house since it requires some skills and clean room with class 1000 as well.

2.7 Quality assurance:

This document is attached in the end of this proposal.

2.8 Warranty:

Per our meeting in ISE show couple weeks ago, we can support additional 5% charge for the second warranty year. The warranty will be started from the shipping date.

In addition, we also have one service center in Bremen Germany to provide Televic the local swap service.

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Please don't hesitate to contact with us should you have any questions.

Thank you very much.

David King
President

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Vice President
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http: //www.kdi.tw
http://www.vibration.com.tw
E-mail:service@kdi.tw

TESTING / INSPECTION REPORT

REPORT NO：VT-120119-2

COMPANY ：LITEMAX Electronics Inc.
ADDRESS ：8F. No.137,Lane 235,Bau-chiau Rd.,Shin-dian City, Taipei County,231,Taiwan
TEL ：886-2-8919-1858
FAX ：886-2-8919-1300
SPECIMEN ：LCD 28”Monitor
DATE OF RECEIVED ：2012/01/09
DATE OF TESTED ：2012/01/18

TEST / INSPECTION ITEMS：Vibration & Shock Test

REMARKS：

- The laboratory is accredited by ISO/IEC 17025 General Requirements for the Competence of Calibration and Testing Laboratory.
- The results only apply to the device under test.
- This report is 20 pages, and no part of it may be abstracted or reproduced.

Test Engineer：	
Approval Signatory：2012.1.30. David Lee	Laboratory Head：Kain Tai Chang

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E-mail:service@kdi.tw

TESTING / INSPECTION REPORT

TESTING EQUIPMENT：

1.Vibration Tester	：KING DESIGN KD-9363EM-600F2K-50N120, S/N：KDS11054783
2.Controller	：DACTRON COMET USB, S/N:9478158
3.Control Accelerometer	：WILCOXON RESEARCH, Model:784A, S/N:23116
4.Vibration Tester	：KING DESIGN KD-9363EM-1000F2K-50N120, S/N：GUG02102091
5.Controller	：DACTRON LASER USB, S/N:12448370
6.Control Accelerometer	：Wilcoxon Research WR-777, S/N:4207

TEST ENVIRONMENT：

Temperature	：22.8 (25±10℃)
Relative Humidity	：68%RH (50±25% RH)

SPECIMEN：

Model	：SSD 2825
Quantity	：1 piece

TEST SPECIFICATION：

Reference to IEC 61373、Class A Body mounted

(1) Random vibration test (Non-Operating)

Frequency	：5 Hz to 150 Hz
Acceleration	：5.9 m/s^2 rms
P.S.D	：1.034 $(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	：Vertical
Test Time	：5 hrs

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Frequency	: 5 Hz to 150 Hz
Acceleration	: 2.9 m/s^2 rms
P.S.D	: 0.25 $(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	: Transverse
Test Time	: 5 hrs
Frequency	: 5 Hz to 150 Hz
Acceleration	: 3.9 m/s^2 rms
P.S.D	: 0.452$(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	: Longitudinal
Test Time	: 5 hrs (Each Axis)
Total Test Time	: 15 hrs

(2) Shock test (Operating)

Wave Form	: Half sine wave
Acceleration	: 30 m/s^2
Duration Time	: 30 mS
No. of Shock	: 3 times (Each Axis)
Shock Direction	: ±Vertical, ±Transverse
Wave Form	: Half sine wave
Acceleration	: 50 m/s^2
Duration Time	: 30 mS
No. of Shock	: 3 times (Each Axis)
Shock Direction	: ±Longitudinal

(3) Random vibration test (Operating)

Frequency	: 5 Hz to 150 Hz
Acceleration	: 0.75 m/s^2 rms
P.S.D	: 0.0164 $(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	: Vertical
Test Time	: 1 hr

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Frequency	: 5 Hz to 150 Hz
Acceleration	: 0.37 m/s^2 rms
P.S.D	: 0.0041 $(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	: Transverse,
Test Time	: 1 hr
Frequency	: 5 Hz to 150 Hz
Acceleration	: 0.5 m/s^2 rms
P.S.D	: 0.0073 $(m/s^2)^2$/ Hz (5 Hz to 20Hz)
	-6dB/oct (20 Hz to 150 Hz)
Test Axis	: Longitudinal
Test Time	: 1 hr
Total Test Time	: 3 hrs

TEST RESULT：

Describe	PASS	FAIL	Non-Judgment
Function judgment	√	——	——
Appearance check	√	——	——

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TESTING / INSPECTION REPORT

Random vibration test photos (Non-Operating)

Vertical

Transverse

Longitudinal

Video

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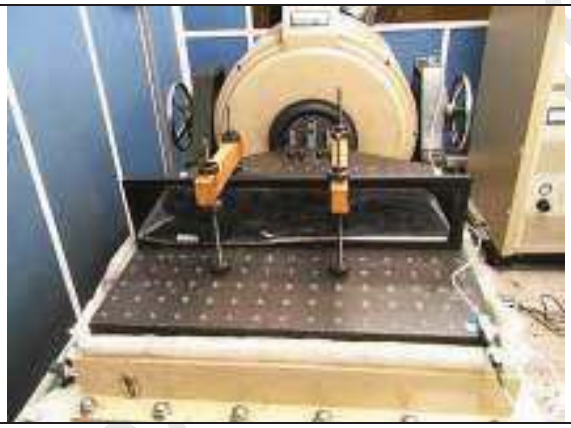
TESTING / INSPECTION REPORT

Shock testing photos (Operating)

±Vertical

±Transverse



±Longitudinal

Video

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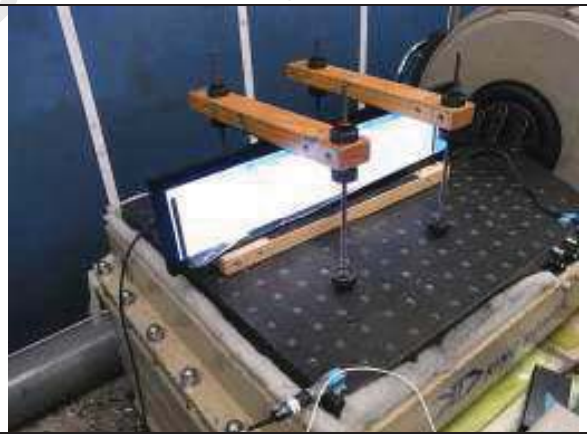
TESTING / INSPECTION REPOR

Random vibration test photos (Operating)

Vertical

Transverse

Longitudinal



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TESTING / INSPECTION REPORT

Testing photos (Test results)
Normal


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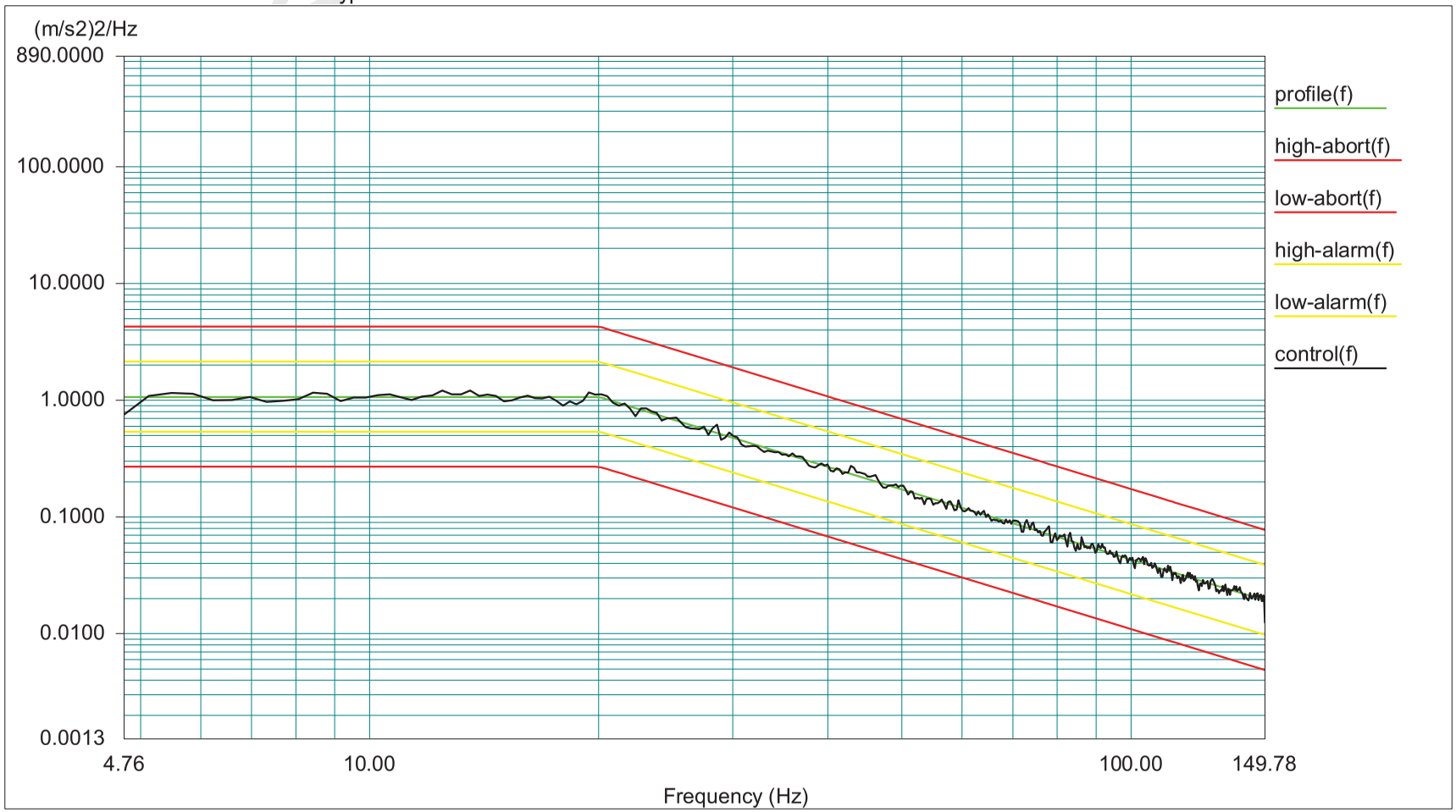
Vertical

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder: .



Level: 100 %

Control RMS: 5.910890 m/s2 Full Level Elapsed Time: 05:00:00 Lines: 400 Frame Time: 2.730667 Seconds

Demand RMS: 5.923646 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.366211 Hz

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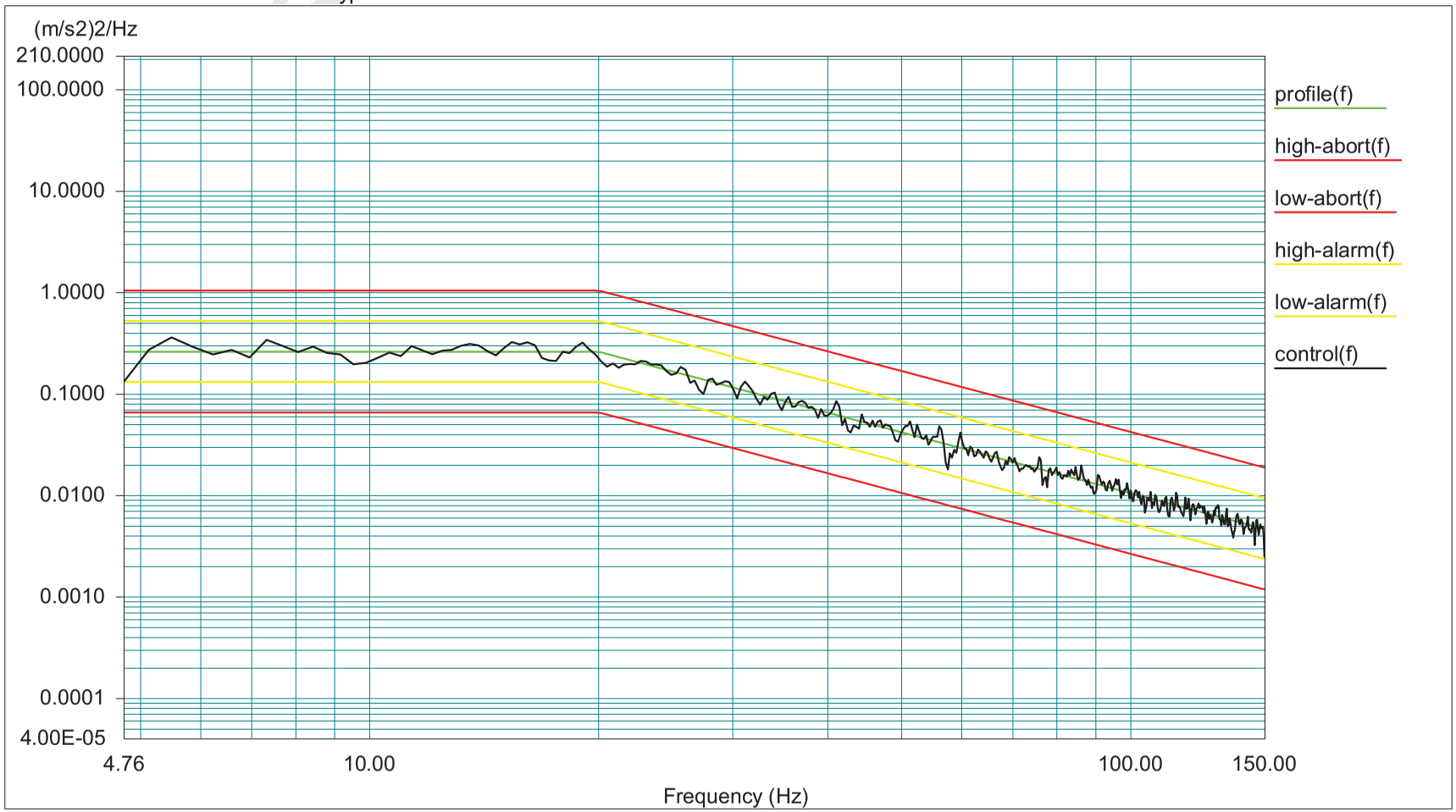
Transverse

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder: .



Level: 100 %

Control RMS: 2.918085 m/s2 Full Level Elapsed Time: 05:00:00 Lines: 400 Frame Time: 2.730667 Seconds

Demand RMS: 2.911622 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.366211 Hz

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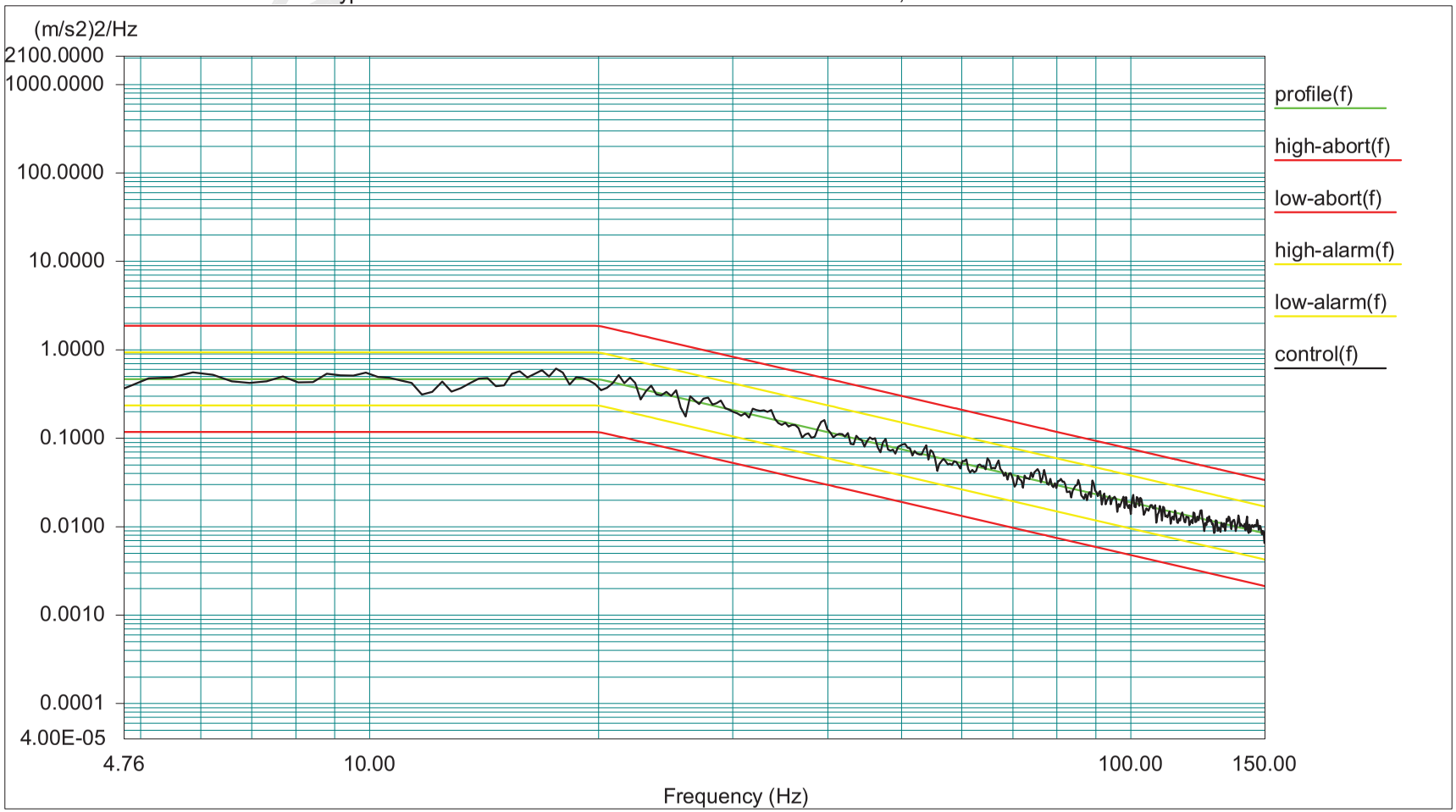
Longitudinal

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder: .\RunFolder Jan 19, 2012 09-53-03



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Demand RMS: 3.915627 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.366211 Hz

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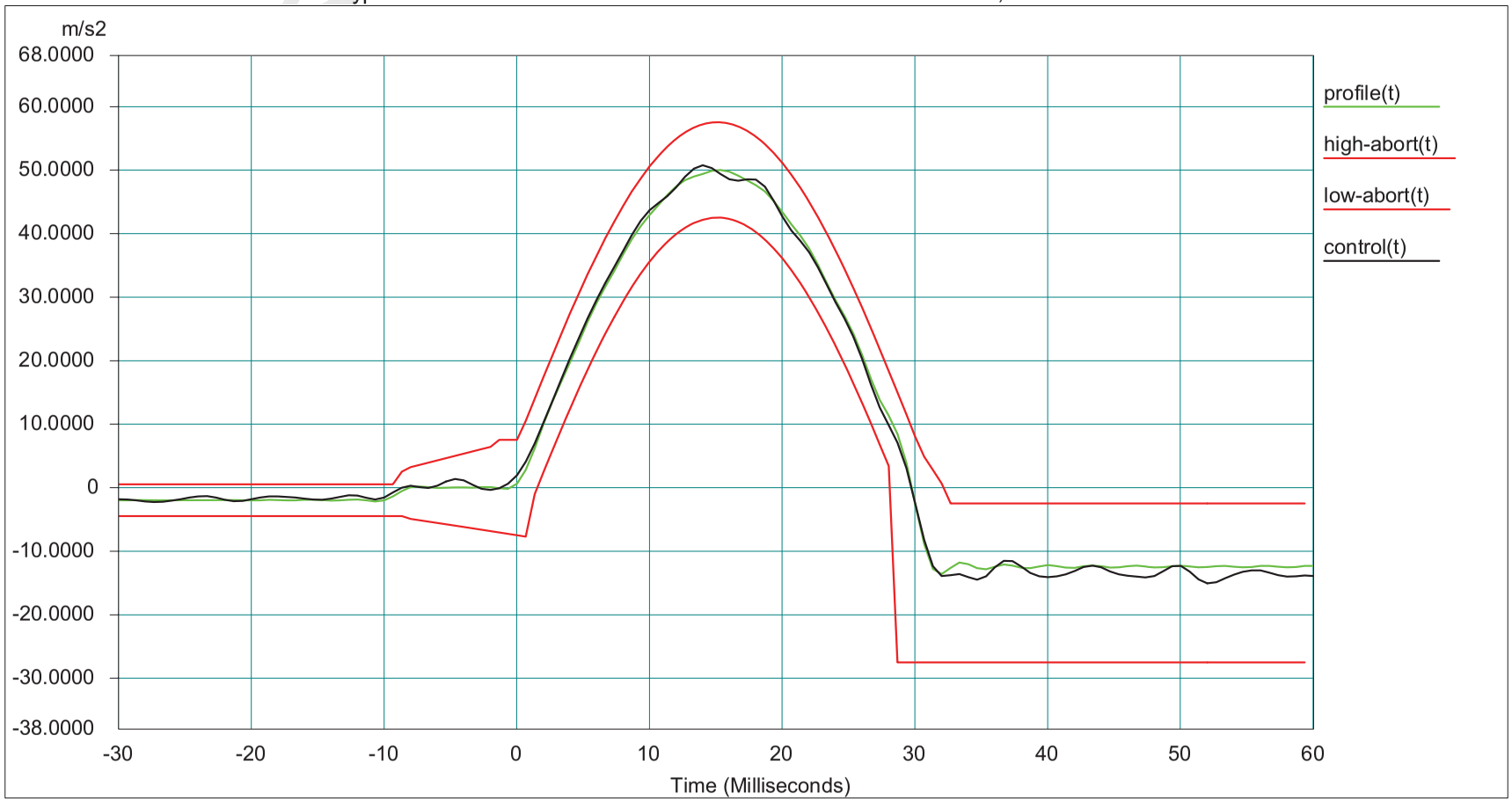
Longitudinal

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder: .\RunDefault Jan 20, 2012 08-52-55



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 50.737358 Control RMS: 6.522688 Full Level Elapsed Pulses: 3

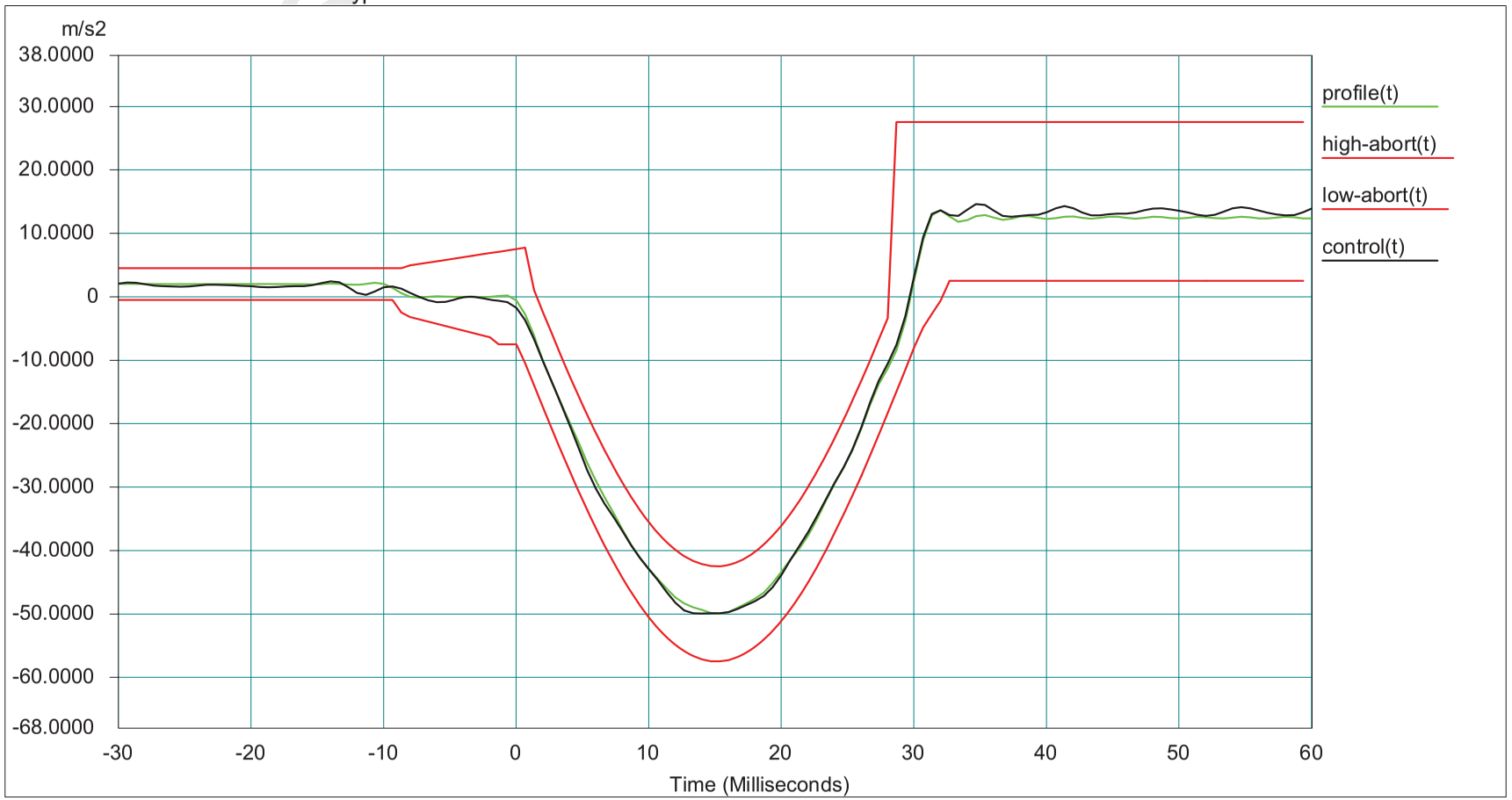
dT: 0.000667 Seconds Demand Peak: 50.000000 Demand RMS: 6.431446 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 50.000000 Pulse Width: 29.999999 ms

-Longitudinal

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder: .



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 49.930225 Control RMS: 6.537138 Full Level Elapsed Pulses: 3

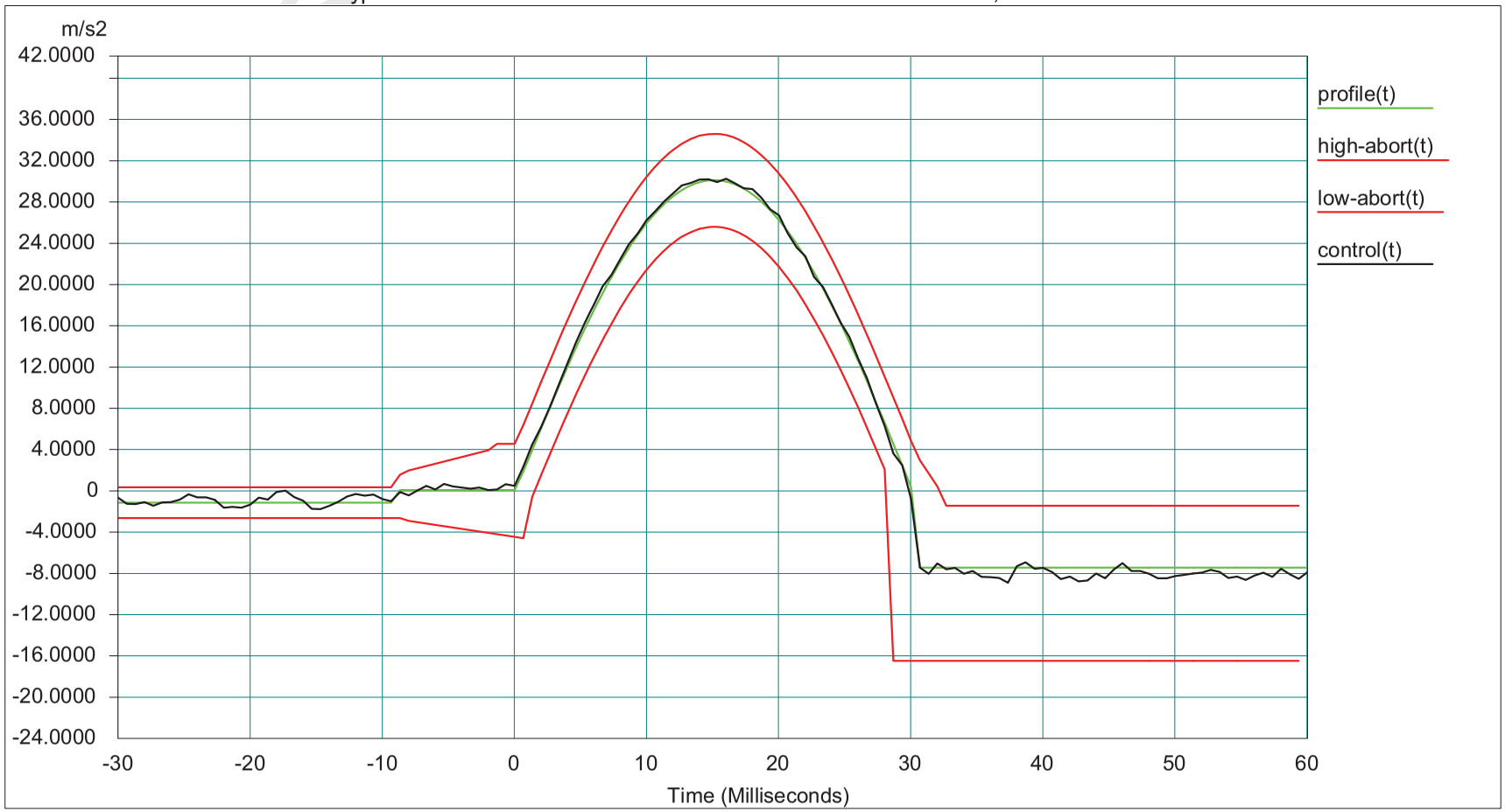
dT: 0.000667 Seconds Demand Peak: 50.000000 Demand RMS: 6.431446 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 50.000000 Pulse Width: 29.999999 ms

+Transverse

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder: .\RunDefault Jan 20, 2012 08-45-52



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 30.162647 Control RMS: 3.935240 Full Level Elapsed Pulses: 3

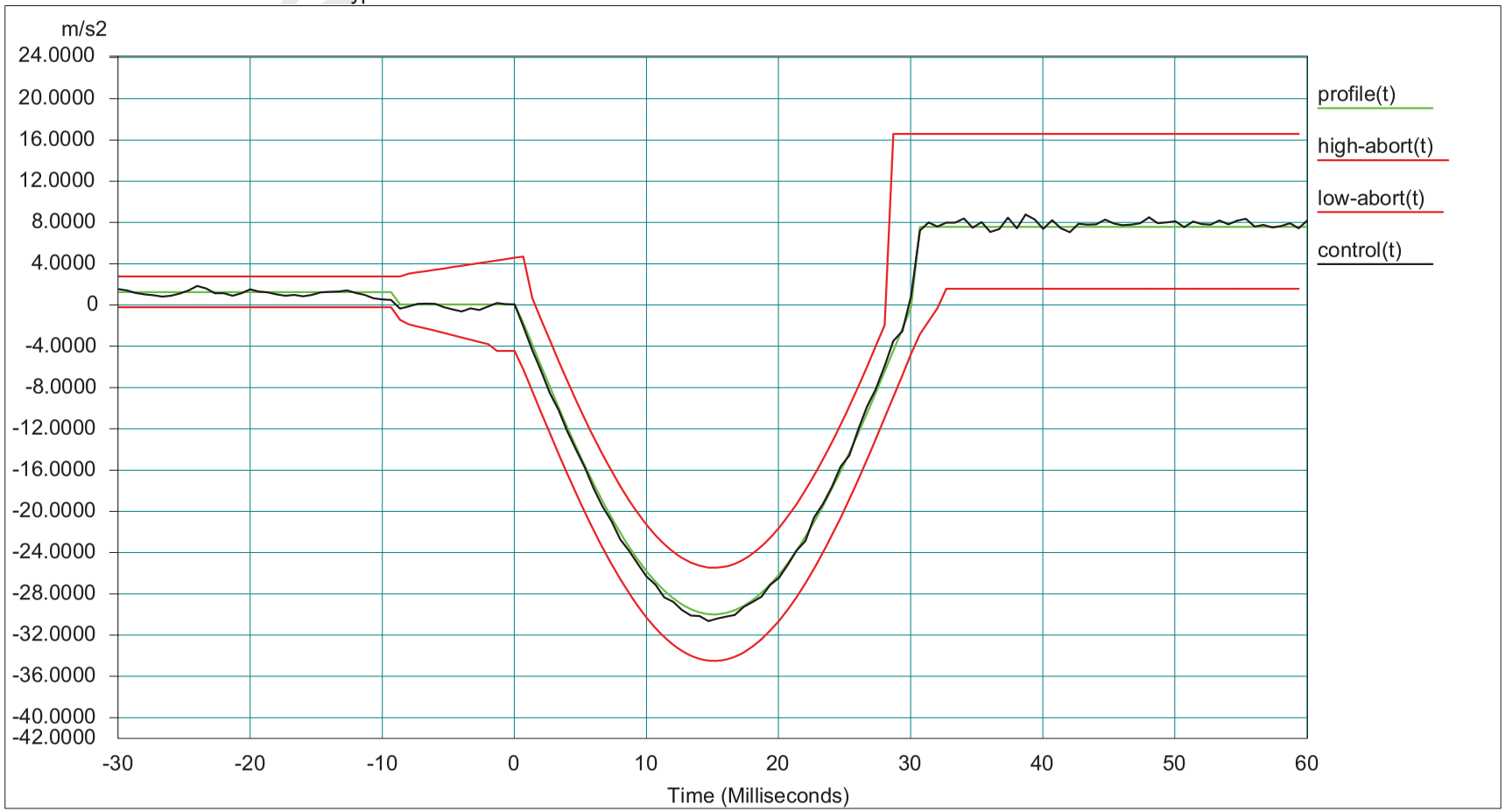
dT: 0.000667 Seconds Demand Peak: 30.000000 Demand RMS: 3.874527 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 30.000000 Pulse Width: 29.999999 ms

-Transverse

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder:



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 30.642141 Control RMS: 3.947988 Full Level Elapsed Pulses: 3

dT: 0.000667 Seconds Demand Peak: 30.000000 Demand RMS: 3.874527 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 30.000000 Pulse Width: 29.999999 ms

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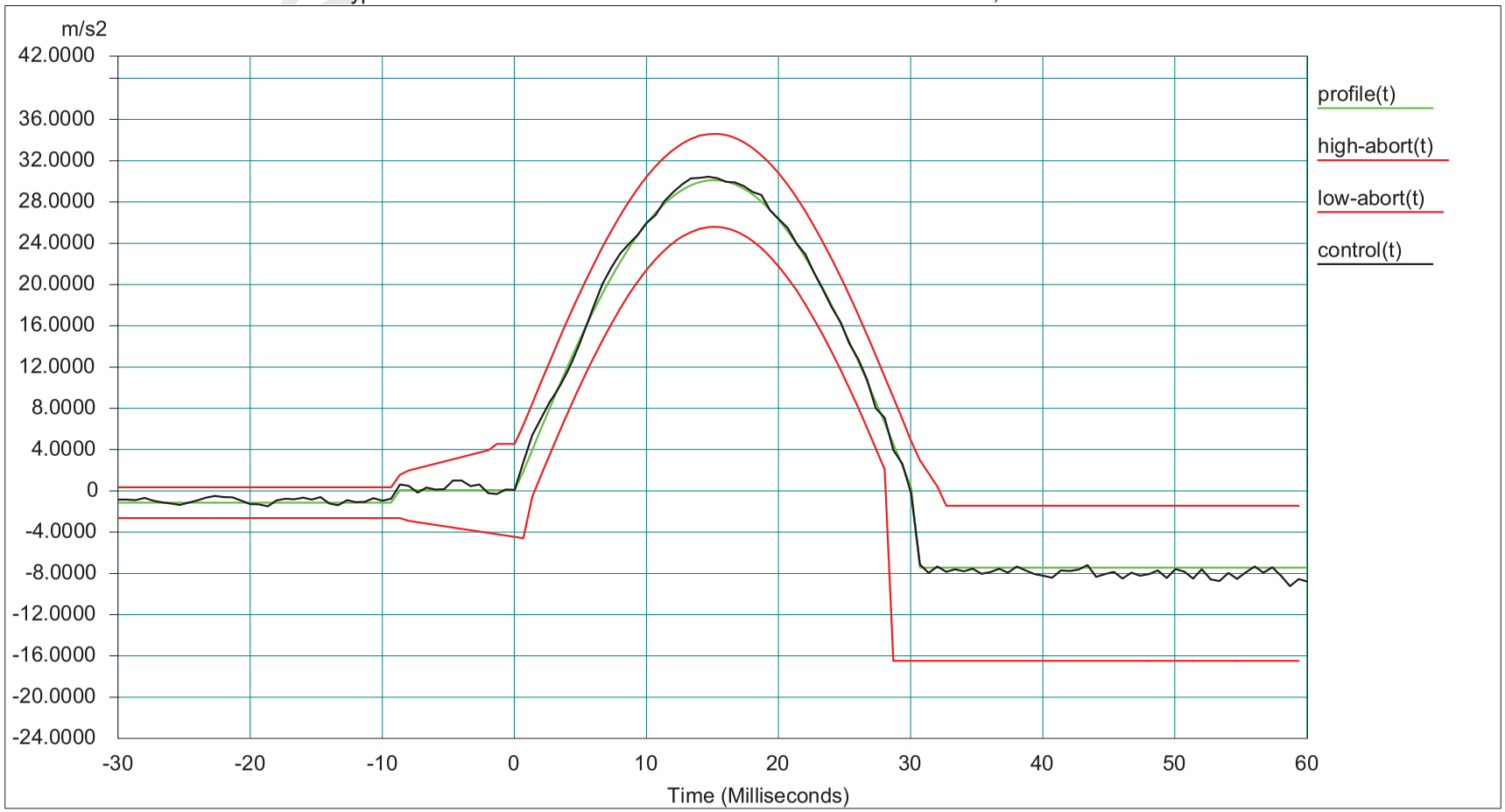
+Vertical

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder: .\RunDefault Jan 20, 2012 08-46-37



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 30.331148 Control RMS: 3.939092 Full Level Elapsed Pulses: 3

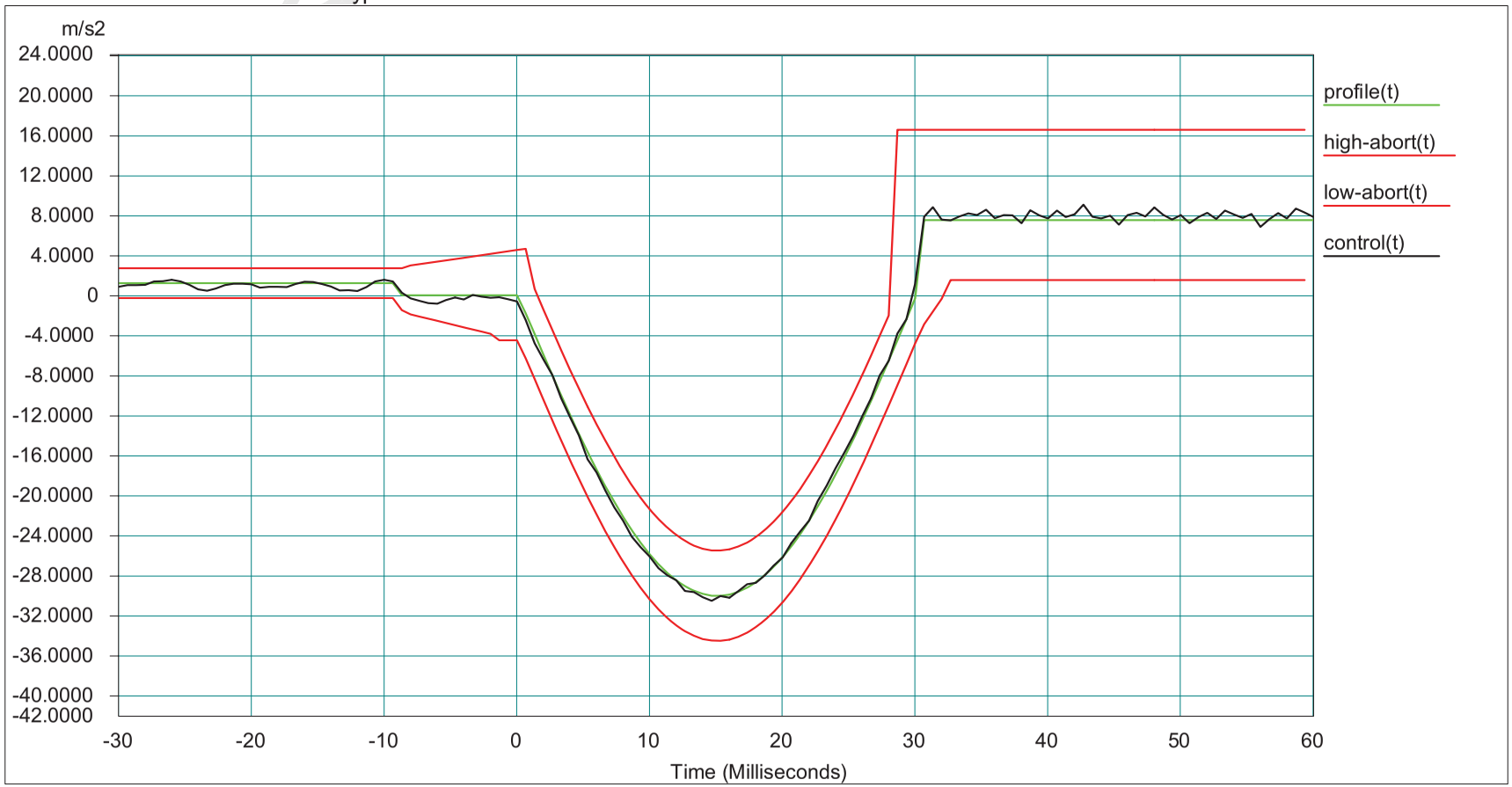
dT: 0.000667 Seconds Demand Peak: 30.000000 Demand RMS: 3.874527 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 30.000000 Pulse Width: 29.999999 ms

-Vertical

Project File Name: 晶達光電

Profile Name: Test Type: Classical Shock Run Folder:



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 1.365333 Seconds Control Peak: 30.505014 Control RMS: 3.935426 Full Level Elapsed Pulses: 3

dT: 0.000667 Seconds Demand Peak: 30.000000 Demand RMS: 3.874527 Remaining Pulses: 0

Pulse Type: Half Sine Amplitude: 30.000000 Pulse Width: 29.999999 ms

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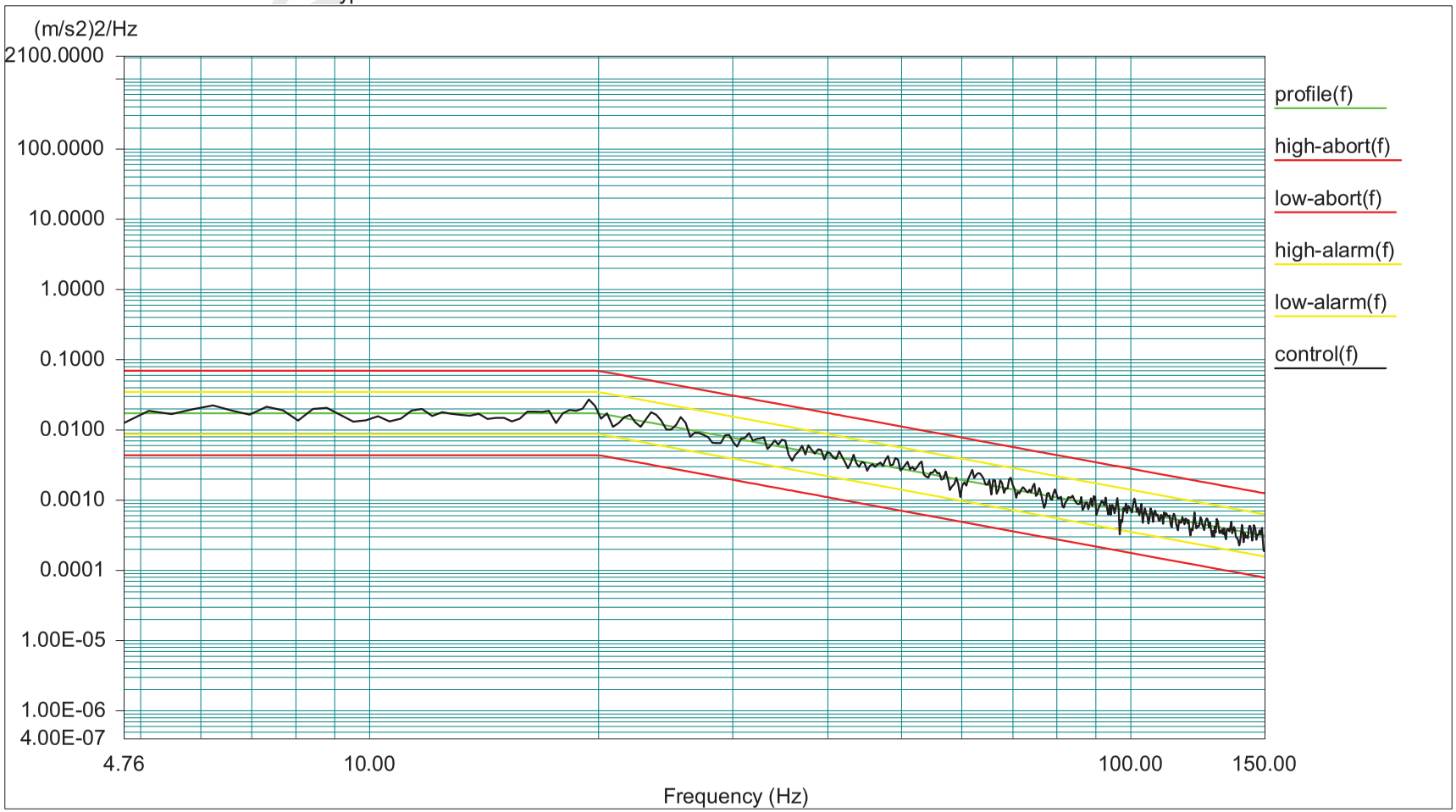
Vertical

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder:



Level: 100 %

Control RMS: 0.757422 m/s2 Full Level Elapsed Time: 01:00:00 Lines: 400 Frame Time: 2.730667 Seconds

Demand RMS: 0.753004 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.366211 Hz

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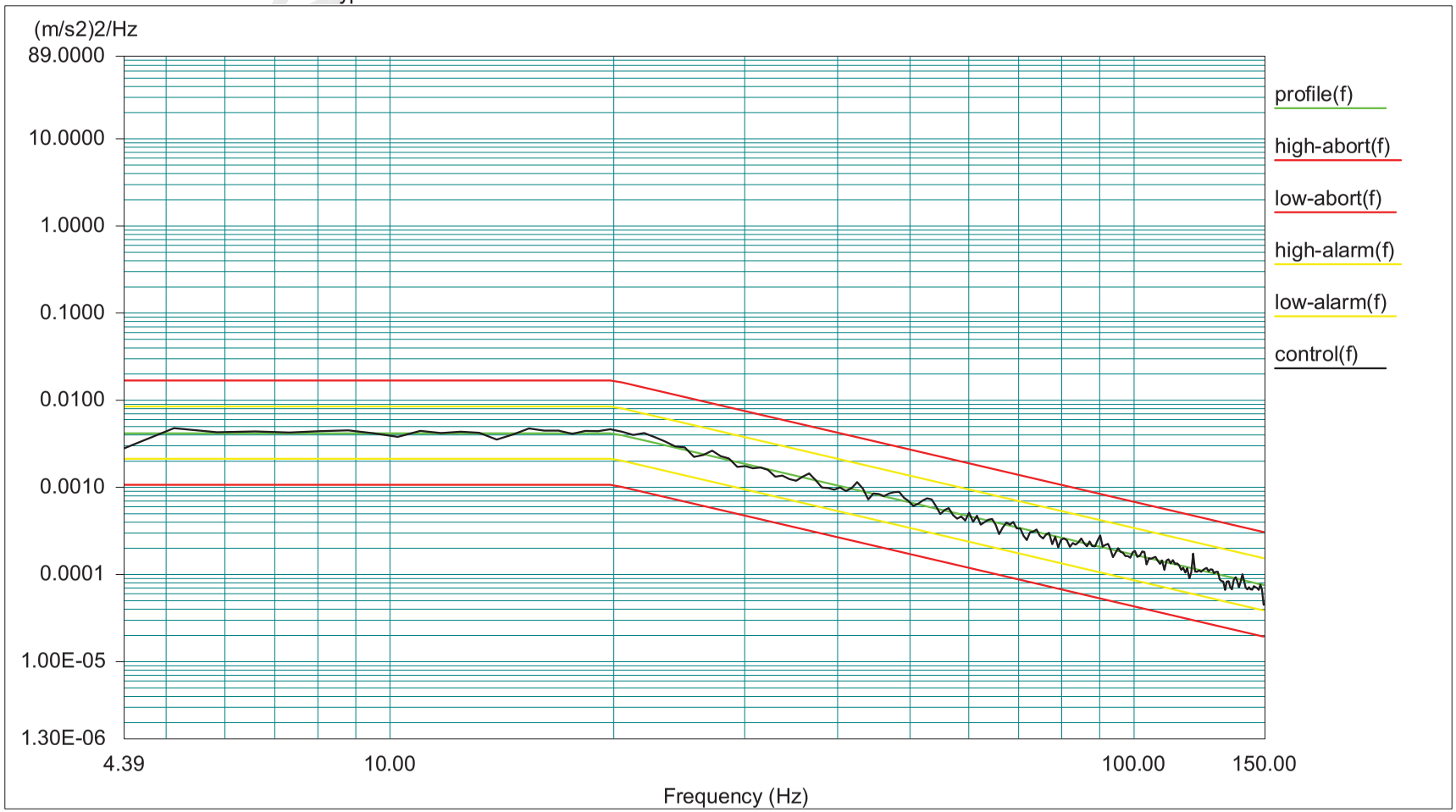
Transverse

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder: .



Level: 100 %

Control RMS: 0.377357 m/s2 Full Level Elapsed Time: 01:00:00 Lines: 200 Frame Time: 1.365333 Seconds

Demand RMS: 0.373015 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.732422 Hz

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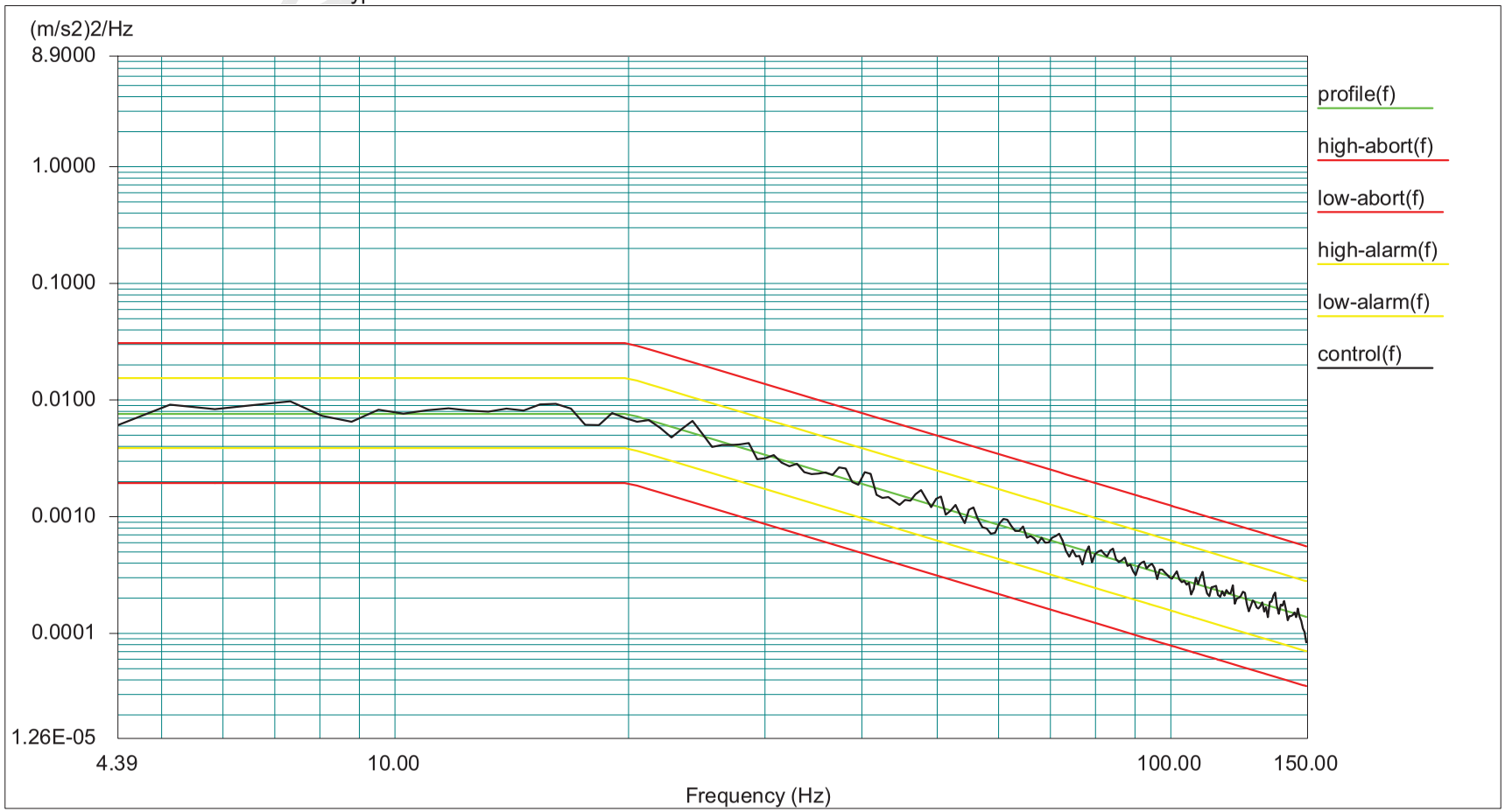
Longitudinal

Project File Name: 晶達光電

Profile Name: Test Type: Random Run Folder:



Level: 100 %

Control RMS: 0.510869 m/s2 Full Level Elapsed Time: 01:00:00 Lines: 200 Frame Time: 1.365333 Seconds

Demand RMS: 0.504075 m/s2 Remaining Time: 00:00:00 DOF: 154 dF: 0.732422 Hz

-END-

LITEMAX
Sunlight Readable LCD!

ENRICH YOUR VISUAL WORLD...

LITEMAX SSF2823/SSF2825

Reliability Prediction (MTBF) Report

(Issue Date:2012/01/16)

Manager	Test Engineer
Michael Lin	Ken Liang

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Reliability Prediction (MTBF)

Ⅰ. Model Name: SSF2823/SSF2825

Ⅱ. Prediction Date: 2012/01/16

Ⅲ. Prediction Site: LiteMax PE Dept.

Ⅳ. Predicted by: Ken Liang

Ⅴ. Equipment: Relex Ver.7.3 Visual Reliability Software

Ⅵ. Simulation Environment:

- •Temperature: 25 degrees C
- •Standard: Telcordia (Bellcore) Standard

Ⅶ. Term and Definition:

- •Unit : An assembly of device.
- •Duty Cycle : Used to specify the percentage of time that the element is in an on state, and it is equal to the percentage of total time the item is in the active environment.
- •Quantity : The quantity of the selected item.
- •Failure Rate : Used to specify that the failure rate is to be calculated based the selected Calculation models. The multiplier is 1,000,000.
- •MTBF : MTBF is always specified in hours.

Ⅷ. Prediction Result:

- •SSF2823/SSF2825 (VHB Panel)
  - Failure Rate:28.342300 ppm
  - MTBF: 35283 Hours

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1. Purpose

This document defines the inspection procedure and criteria for quality control of outsourced manufacturing and LITEMAX manufacturing.

2. Scope

This document is applicable to the products manufactured by LITEMAX or outsourced unless otherwise specified by clients.

3. Definition of Terms

3.1 Critical Defect：

Any defects seriously cause the damage of product,the danger of user safety or violation of related law.

3.2 Major Defect：

Products do not meet the criteria of their specification,or any defects may results in functional failure or reduce the usability of products themselves.

3.3 Minor Defect：

Any defects do not reduce product usability or result in functional failure.

3.4 Inspection 'Lot'

Lot means the products are from the batch of same source,same specification and same condition,and is also the quantity of inspection.

3.5 LCD：Liquid Crystal Display

3.6 TFT：Thin Film Transistor

3.7 Durapixel：LED Back light module

3.8 Bright dot：Full-time lighting Dot in the Black display.

3.9 Black dot：Dot which seems to come out in black on the white display and Red/Green/Blue monochromatic display.

4. Inspection criteria/Conditions/Tools

4.1 Follow these criteria for general inspection. Otherwise, refer to SOP or requirements if any items are not included in these criteria.

4.2 Inspection conditions

Environmental temperature：25±5℃

Environmental Luminance：300~700Lux

Viewing Distance：The distance between object and viewer's eyes should be 60±5 cm.

Viewing Angle： The angle between object and viewer's eyes should be 90 degree.

Viewing Area：Active Area.

Viewing Time：Within 10 seconds.

Signal Source：PC

Software：NOKIA Calibration

4.3 Inspection Tools：Dot-Line Gauge,2%ND Filter, BM9

4.4 Screen Resolution：According to panel Spec

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5. Sampling Criteria

5.1 Follow MIL-STD-105E LEVEL II single sampling inspection.
5.2 Major Defect (MA) 0.65%
Minor Defect (MI) 1.0%
5.3 Refer to client's requirement for specific case.

6. Inspection Items And Criteria

6.1 Appearance Inspection Items and Criteria

Appearance Inspection Items and Criteria				
Item	Item Description	MA	MI	Standard
1	Scratch		●	0.1 mm＜W≦0.3mm，L≦30 5 maximum L>30mm or W>0. 3mm Unacceptable
2	Bubble/ Dent		●	1.0 mm＜D≦1.3mm 8 maximum D>1.3mm Unacceptable
3	Foreign Particle		●	0.3＜D≦1.0mm 8 maximum D>1.0mm Unacceptable 0.1 mm＜W≦0.3mm，L≦15 5 maximum L>15mm or W>0. 3mm Unacceptable
4	Outer carton labeling inconsistent with specification		●	According to BOM (Except Client's Requirement)
5	Serial No Label missing or broken, or inconsistent with specification		●	According to BOM
6	Warranty sticker missing or broken		●	According to BOM
7	Appearance distortion		●	
8	Screws missing or limp		●	
9	Mylar unclean or dirty		●	
10	LED cable broken		●	
11	Bezel		●	Can't see the metal color

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6.2 Electrical Inspection Items and Criteria

Electrical Inspection Items and Criteria				
Item	Item Description	MA	MI	Standard
1	Line defects(Vertical / Horizontal)	●		Can't be seen
2	VGA no signal output	●		Not allowed
3	No Back light	●		Not allowed
4	Corona spot		●	Use of 2% ND filter not noticeable
5	Display non-uniformity or Mura		●	Use of 2% ND filter not noticeable
6	Light leakage		●	In white or black pattern Use of 2% ND filter not noticeable
7	White mark		●	View 90 degree form Panel not noticeable
8	Wrinkle film		●	View 90 degree form Panel not noticeable
9	Bright dots/Dark dots/Total dots		●	0/7/7
10	Bright dots -2 Adjacent/ Dark dots -2 Adjacent		●	0 pair/1 pair
11	Brightness	●		According to RD SPEC

Note: 1.The definition of dot:The size of a defective dot over 1/2 of whole dot is regarded as one defective dot.
2.ND filter should be used between the LCD panel and eyes of the inspector to have a screen-check for 2~3 seconds. ND filter should be used at the distance 150±50cm to the front surface of display Panel. ND filter should be used at the distance 2~3 cm with eyes.
3. Any inspection items not listed above, the judgment (MA/MI) should be classified by examined fact.
4. If any other defective functions or items, please list above.